

Diggin' in the Dirt: A Look at Seed Viability

By Chip Bubl
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Extension Service - Columbia County
The OSU Extension Office is fully
reopened. Mask still required inside.
The best way to reach me directly is
with the email below.

Events:
Master Gardener Training: We are still unsure whether it is possible to hold a live class this spring. It won't start in February but might get started mid-March or later. It will be in St. Helens if we have it. COVID is so challenging. Call or email us for updates.

Grafting workshop: It will be held in person at the OSU Extension office in St. Helens on Saturday, February, 26. Cost is \$20 for five apple rootstocks and scions to graft onto them. Most people end up with four and often five new apple trees. Time will be from 9:00 am until noon. Class limited to the first 15 people due to safety issues with knives used in grafting. Masks will be required.

Columbia County Small Woodlands Association tree sale is back! On Saturday, March 12, Columbia County Small Woodlands Association will hold its 23rd annual tree sale. The sale begins at 8:30 am at the Lawrence Oil (Pacific Pride) parking lot in St. Helens on Hwy 30. The address is 845 N Columbia River Hwy. 22 different species of deciduous and conifer trees will be available for purchase. Prices range from \$1.50 to \$6. We will also have bags of Douglas fir, noble fir, western red cedar, and

coast redwood available for purchase. Cash and checks will be accepted for payment. As always buyers are advised to come early for best selection.

Seed dormancy and summer garden weeds

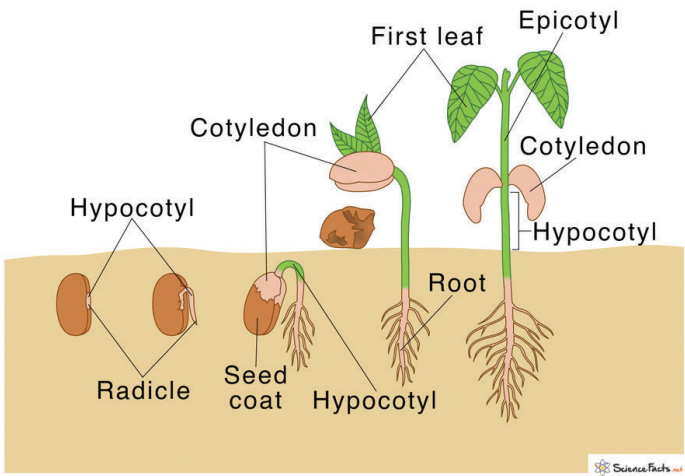
Seeds of native plants and our weed seeds (mostly non-native plants) have evolved complex strategies to survive years in soil. Temperate zone seeds that grow spring through fall are dormant through at least their first winter. That makes sense, since an acorn that germinated in a warm, moist October would be toast in cold December.

A plant hormone "sits" on the seed dormancy "lock". The hormone concentration decreases as the seed essentially measures winter temperatures. When enough cold weather is tallied, the hormone "lock" is released and the seed is free to germinate. The seed then responds to warm, moist soils to send out its root and shoot and face the challenges of the above-ground world.

But here is where it gets even more interesting. If a lambsquarters plant sheds its 50,000 seeds in July, they won't all germinate the next summer. Some are locked for one winter, but other seeds may have to measure 5, 15, or even 30 winters before they can germinate! That is hedging their genetic survival bet big time. And that is what evolution is all about. For those plants, their genes will survive even if some summers are lethal to their newly emerged seedlings since still-dormant seeds will germinate in the coming years.

This might make you think, what about our vegetable seeds? Don't we want them to germinate all at once? The answer is yes, we do want complete germination. So, from the wild plants they came from, we have (over about 4,000 years or more) bred most of the genetics of delayed germination out of them. If we were to disappear from the earth, the lettuces, beans, peppers, cabbages, etc. that retained some vestigial genes for surviving winter would revert to their wild-type forms quickly. The faster they did it, the more competitive they would become in a world without us.

There is a long running experiment on weed seed longevity in Michigan, started by Professor Beal. In 1879 (!), he mixed seeds of a number of weed species in sand, placed the same



mixtures in a number of glass tubes, and buried them. Each tube had multiple seeds of each species. A tube has been dug up, first at short intervals and now at 20 year intervals. When a tube was dug, the seeds were tested for germination in a greenhouse. At the current 142 years, only one plant, a mallow, still germinated. But a number lived well into their 80s or more. For more information, see <https://www.nytimes.com/2021/04/21/science/beal-seeds-experiment.html>.

There are records of seeds that have been buried for 800 or more years and remained viable. But where they were buried makes a huge difference. Most were in far north latitude peat bogs. Those seeds were almost continuously waterlogged and the soil temperatures were very low. Those combined conditions slow respiration to a crawl (a seed, even dormant, is still alive) which maintained their viability. The Egyptian pyramid stories (dry and warm) are not very reliable.

The table below gives some information about seed production per plant per year and the potential survival rates over time. All are summer annuals except Canada thistle which is an her-

baceous perennial plant. But there are a lot of factors that affect survival. A lot of insects, small mammals, and even fungi will take the seed numbers way down. Seeds left on the surface are more vulnerable in comparison to ones that are buried. Grass seed survival times are quite low relative to broadleaf weeds.

Free newsletter (what a deal!)

The Oregon State University Extension office in Columbia County publishes a monthly newsletter on gardening and farming topics (called *Country Living*) written/edited by yours truly. All you need to do is ask for it and it will be mailed or emailed to you. Call 503-397-3462 to be put on the list. Alternatively, you can find it on the web at <http://extension.oregonstate.edu/columbia/> and click on newsletters.

Take excess produce to the food bank, senior centers, or community meals programs. Cash donations to buy food are also greatly appreciated.

The Extension Service offers its programs and materials equally to all people.

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	Number	Seed
	of seeds	survival
Weed species	per plant	(years)
Lambsquarters	72,450	40
Purslane	52,300	40
Dandelion	15,000	6
Pennsylvania smartweed	19,300	30
Canada thistle (per stem)	680	21
Pigweed	117,400	10
Barnyardgrass	7,160	3
Crabgrass	25,000	3

Vernonia's Voice
is published
on the 1st and
3rd Thursday.
Look for our
next issue on
February 3.

New Day Massage and Bodyworks #10732
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and a New Year of Community Building

 **Vernonia Christian**

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